

NBC's Federal Cloud Playbook

Take Advantage of Cloud Computing in Your Agency

Inside:

The Federal Cloud

NBC's vision for Cloud Computing:
Customer focused, flexible & simple.

Cloud Capabilities

NBC is building its customers a cloud-centric infrastructure, with IaaS, SaaS & PaaS capabilities.

Grow Your Cloud

Pilot the Cloud at your agency.
Suggested projects and approaches.



The Federal Cloud

Agencies seek to harness the power and efficiency of Cloud Computing.

The National Business Center (NBC) wants to help agencies break through the hype and reach a common understanding on why Cloud Computing can be a powerful driver to help reshape the delivery of IT services. NBC believes that making Cloud Computing relevant to the Federal Government means not just examining its advantages, but also understanding and addressing its unique risks.

Throughout this white paper, you will be introduced to the characteristics of Cloud Computing, implementation approaches, and some ways to get started with Cloud within your agency. It is important to recognize that Cloud technologies are still emerging, and varying definitions for what Cloud is exist. Let's begin by establishing an analogy that relates the advent of Cloud back to another transformative technology - centralized electricity distribution. In the early 20th century, electricity was generated close to or at the place it was to be consumed. Factory owners often built their own electrical power plants, or built their facilities close to rivers to use the power of water to turn turbines and generators. This was inefficient and expensive, and it forced factory owners to split their attention between their own line of work and the maintenance and operation of their electrical generating facilities. With the advent of centralized utility companies, this all quickly changed.

In his 2008 book *The Big Switch*, author Nicholas Carr writes that "...utilities' superior economies of scale, combined with their ability to use their capacity much

more efficiently by serving many different customers, would allow them to deliver power to factories at a lower price than manufactures could achieve with their private dynamos"

The same sea change that electrical distribution underwent then is happening in information technology now. Cloud Computing allows businesses and the government to take advantage of remote computing power and applications that might not live in their on-premise data center. These services are subdivided into several categories, depending on the part of the traditional IT ecosystem they seek to replace. Typically, these are Software-as-a-Service (SaaS), Infrastructure-as-a-Service (IaaS) and Platform-as-a-Service (PaaS):

Cloud Service	Description
SaaS	Software applications delivered over the Internet. SaaS applications are available on-demand, and typically run from within a web browser.
PaaS	A fully-fledged software development and hosting environment available as a service over the Internet. Applications are built to run on a specific PaaS platform.
IaaS	Computer infrastructure such as servers, desktops or network equipment, delivered over the Internet. IaaS resources are able to scale easily according to demand.

Some examples of SaaS include enterprise software, such as email, instant messaging and collaboration tools delivered via a web browser, but operated and maintained by a separate entity. IaaS might involve outsourcing specific types of IT infrastructure, such as web servers, to an IaaS provider. PaaS environments allow software developers to write applications and deploy them directly to the Cloud, removing infrastructure from the equation entirely.



Why Cloud & Why Now?

Several forces are combining to drive agencies toward Cloud Computing

Scalability

The advent of Cloud Computing has pushed the cost of Cloud-based IT resources down significantly, redefining the market for enterprise computing. For example, let us say your agency is faced with a new regulation that requires it to extend its data retention period by several years. In the past, this might have necessitated a new investment in server and storage hardware, backup equipment, and new staff to manage and maintain the data. With Cloud Computing, an elastic pool of resources is available to your agency whenever it has the need.

Deploy New Systems

IaaS allows groups of users to provision, use, and then discard infrastructure on an as-needed basis. Agencies can forgo purchasing expensive infrastructure up-front only to have it sit idle. For example, say your agency is about to deploy a new, high profile website. Although the initial demand over the first week is expected to be very high, it will likely tail off over time. Using a Cloud service such as IaaS, your web developers and infrastructure team can deploy several new web servers to handle the load, and then literally “delete” them after the initial crush has past. You will only be charged for the servers when they’re being used, and once you’re agency no longer needs them, you will not need to keep paying for them.

Lower Costs

Because Cloud IT services can be managed centrally and offered to thousands of users simultaneously, Cloud applications can be delivered at a unit cost drastically lower than services that are run, managed, and delivered locally. In the Cloud, pricing happens a bit differently. Services aren’t often bought up-front or as part of a solution. Cloud services are often purchased in reserved blocks or billed on a à la carte basis. Agencies can take advantage of the economics of Cloud storage in several ways.

SaaS applications are monitored, maintained and upgraded centrally, minimizing the need for your staff to manage upgrade cycles themselves. PaaS holds the promise of eventually short-circuiting how software is deployed and managed, allowing agencies to deploy applications more rapidly to infrastructure that expands and contracts (and is charged) as required. Let us consider a common IT challenge agencies need to navigate. Some of the business users in your agency have identified the need for a new performance management system. The system must collect data from several legacy systems, and provide graphical dashboard to allow agency stakeholders to react appropriately. In the past, this might have been addressed through the purchase of on-premise infrastructure and up-front software licenses.

Now, by using SaaS or PaaS, an agency can act to minimize two of the largest cost drivers for enterprise systems: licensing and infrastructure. Because SaaS software can be licensed on a subscription basis, your agency will only pay for the portion of the software they are actually using at a given time. Operational costs such as software maintenance and upgrades, infrastructure and support are bundled into this subscription cost. This allows CIOs to tie operational expenses directly to business outcomes, and avoid prohibitively large life cycle costs that can impact even the best planned and executed IT projects.

Make IT More Flexible and Responsive

Agency CIOs and decision makers need to recognize that a large part of the appeal of the Cloud is that it brings technology closer to business users. With Cloud technologies, business users have rapid access to servers, storage, and computing platforms that were once the exclusive domain of IT. While this raises important policy and regulatory issues, if the Cloud is to be successful in the Government, it needs to retain this characteristic. Users have driven the spread of Cloud Computing because it simply allows them to solve their business problems faster. Cloud enables user-driven provisioning of Cloud resources.

Administration’s Focus on Cloud

The President’s FY 2010 Budget specifically identifies Cloud Computing as a way “...to optimize the Federal data facility environment and create a platform to provide services to a broader audience of customers.”



NBC's Cloud Computing History

Cloud Computing is part of NBC's DNA

NBC has a long history of providing information technology shared services to federal agencies, and expanding its product offerings to meet the needs of their customers. To NBC, Cloud Computing is another way for them to keep their technological edge and maintain customer satisfaction. NBC's past experience with Cloud Computing originated with mainframe applications and evolved on to a client-server architecture as the needs of its customers changed.

Clearly, NBC is no stranger to delivering multi-user services. Now and in the past, NBC has worked to provide access to government financial management systems, human resources packages, acquisition automation and other enterprise applications. NBC usually offers these applications as turn-key solutions to other federal government agencies. NBC develops custom applications based on its customers specifications, and provides the infrastructure to support them. In other scenarios, NBC hosts and manages COTS and GOTS packages on behalf of its customers.

In most cases, NBC's role is to manage the complete stack of software and supporting infrastructure. NBC's Cloud Capabilities will be able to leverage its experience in implementing and managing Cloud-style services for its customers.

Virtualization

NBC's is taking its experience with mainframes and extending it to the Cloud. NBC is working to leverage its mainframe infrastructure to allow customers to provision servers directly via a simple web-based interface. NBC's massively scalable z/Series mainframes will allow customers easy access to a powerful infrastructure platform designed for intensive data processing applications. In addition to its work with z/Series, NBC has a history of providing x86 virtualization to internal clients and serving a variety of different application requirements and service levels.

Service Oriented Architecture (SOA)

NBC's commitment to its customers has involved the implementation of cutting edge technology in the past - NBC was one of the first shared services providers to

embrace SOA, and much of its current infrastructure is accessible via web-standard protocols. In the future, NBC intends to continue expanding the use of SOA and allow other agencies and information systems to access NBC enterprise applications over web services. NBC sees SOA as the centerpiece of its integration strategy for Cloud services.

Through SOA, NBC will allow different applications to interact with each other seamlessly, building the framework for Cloud interoperability. NBC sees SOA as a way to transition customers away from "servers in the cloud" and towards a more integrated and accessible shared services approach.

In the future, SOA will become prevalent across all of NBC's applications, giving customers the ability to integrate NBC enterprise systems into other business processes. For example, a customer's in-house HR system could integrate directly with NBC's payroll system shared service. In the next several months, NBC plans to deploy several business applications integrated with core legacy systems via SOA through a series of pilot-to-production implementations.

Cloud Computing & Convergence

Cloud Computing is an evolution of the shared service model

NBC sees Cloud Computing as another way for government agencies to take advantage of an increasingly important concept: the convergence of government business functions and the advent of the shared service center. Central to NBC's mission is the idea of a converged Shared Service Provider (SSP) that allows the government to streamline its business operations and leverage a common infrastructure.

NBC's Cloud Computing initiative is an evolution of this approach. NBC knows the value that centralized services can provide to the government, and sees Cloud as another way to extend this concept.

Mapping the Spread of the Cloud

In the private sector, the Cloud industry is growing quickly as vendors invest significant amounts of money in the development of Cloud products. This suggests that even mainstream IT companies believe in the success of the Cloud. Many experts feel that the Cloud market will drastically expand in the coming years. For the 2008–2013 period, Gartner predicts an impressive growth of the Cloud Computing market from \$9.1 to \$26.6 billion. Government agencies should take note of the rapidity with which the Cloud is becoming prevalent in the private sector, and attempt to determine if its advantages carry through to government.

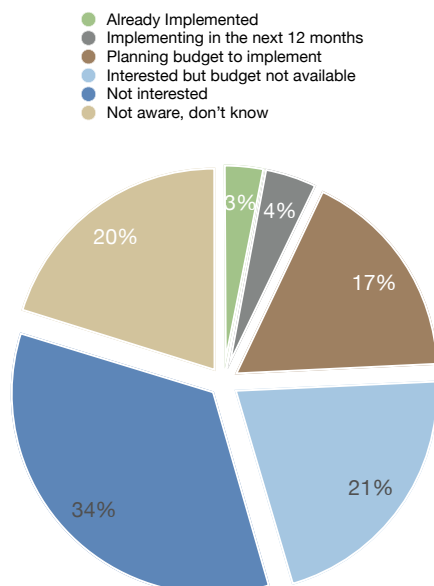
Software-as-a-Service

SaaS has become increasingly popular over the past several years. Today, more than 40% of companies report using SaaS within their organization, while only 15% were using SaaS in 2006.

A recent Gartner survey estimates that 92% of the companies currently using SaaS plan to maintain or increase their investments in the technology. Among the same users, one-third of respondents are planning to transition from on premise to on demand applications.

Infrastructure-as-a-Service

According to a 2009 Forrester survey only 3% of companies worldwide will have adopted IaaS. However, an additional 4% have already planned an implementation in the next 12 months. Despite the low adoption rates, there is strong interest for IaaS throughout the market.



Larger enterprises show a higher level of awareness, interest, and adoption of external IaaS than small firms, while retail/wholesale companies lead the market in budgeting for IaaS with little difference by region. While current awareness of IaaS is relatively small in the Government sector, NBC is seeing increased demand in their conversations with customers.

Platform-as-a-Service

Despite demonstrable benefits and high interest, PaaS adoption has been slow to take off for several reasons:

- The PaaS solutions are relatively new and still lack reliable credentials.
- There are no PaaS standards as programming languages differ from one vendor to the other, implying a lock-in aspect for clients.
- There are a number of challenges underlying a transition from traditional on premise platforms to platforms-as-a-service, such as the integration with on premise environments and the need to learn new programming models residing in the Cloud. This issue seems to be of special concern for Government agencies.

However, in the coming years most of these inhibitors will be mitigated and the confidence in PaaS models will grow. Other government agencies are implementing internal PaaS capabilities that allow developers to build applications, and share them with their colleagues.

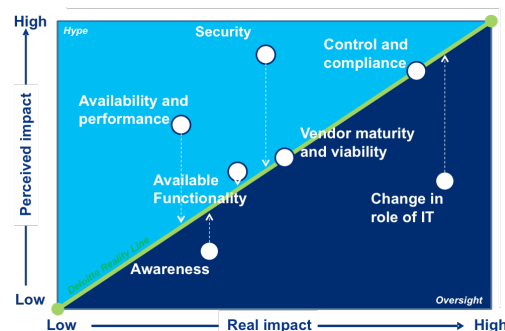
NBC will address the security and regulatory concerns allowing the Cloud to become the infrastructure of choice for government agencies.



Risks In the Cloud

The Cloud has unique security and regulatory risks for government agencies

While the advantages of Cloud Computing are clear, there are some issues you should carefully consider as you seek to leverage the Cloud at your agency:



The diagram shows several risk factors to consider, some technological, some organizational:

Risk: Organizational Awareness

Your organization might not be entirely up to speed on what Cloud Computing is. Internal change management solutions might be needed in order to orient your IT and business users to the benefits of Cloud.

Risk: Privacy

A major concern with using Cloud capabilities is that outsourced services are not as secure as their on-premise counterparts. Indeed, information security was identified as one of the top concerns for IT leadership in a recent Information Week survey on Cloud Computing. Given the location of data outside of agency firewalls, its

multi-tenant architecture, and the abstraction inherent to Cloud services, there is certainly some legitimacy to these fears.

Risk: Change Management

Direct, physical control of computing infrastructure is something that agencies have grown accustomed to. IT organizations within these agencies aren't necessarily comfortable with, or even willing to provide technology resources via hardware that isn't under their immediate supervision.

Risk: Availability & Performance

Using the shared infrastructure of a Cloud provider means that you are dependent on their capacity and facilities. Downtime, scheduled or unscheduled, will directly impact your agency's access to Cloud resources.

Mitigation Strategy: Contractual Protection

Agencies should look to contractual protection to ensure vendors adhere to acceptable practices, as well as to manage planned and unplanned outages. Enforceable SLAs should be in place and performance monitored automatically by the vendor.

Mitigation Strategy: Security Audits:

To mitigate this risk, work with your Cloud vendors carefully to be certain that the information protection regimen they have in place is similar to your own and is compliant with all relevant Federal guidelines. If possible, perform audits with your vendor.

Mitigation Strategy: Certification by Third Parties

Cloud providers are increasingly complying with IT security norms such as federal security management certifications. Other guidelines, such as A-123, may need to be considered.

Mitigation Strategy: Leverage Standards

The Cloud industry is pushing for standards, with initiatives such as the CSA (Cloud Security Alliance). Such early efforts should be watched closely as new standards emerge.



Availability and Performance

Can your agency rely on the Cloud?

Cloud services are rapidly becoming more reliable as providers focus more and more on large enterprises and government. Google and others are reaching uptime percentages in the range of 99.9% nearing all but the most demanding enterprise's expectations.

Provide	Service	Availability SLA
Google Apps	SaaS	99.9% uptime SLA
Amazon S3	IaaS	99.9% uptime SLA

Stability and performance tend to prove better in the Cloud given the scalability and abstraction of Cloud services, as well as the increasing use of web and service oriented architectures. For this reason, compute intensive initiatives, such as major research projects, are increasingly looking to leverage the Cloud's power. Nonetheless, a basic constraint to Cloud services remains network latency.

As a government stakeholder, it is up to you to push for contractual terms to be included in SLAs where relevant, and to balance these with the benefits of disaster recovery that come with the Cloud. CIO's cite DR as a key driver for moving to the Cloud. NBC feels that agencies should pay special attention to Cloud providers that offer variable SLAs. The ability to access different SLA tiers, and match them to different requirements will help agencies be more flexible in their use of Cloud resources.

Control and compliance – can you trust the Cloud?

With Cloud Computing's abstraction of IT resources, your agency will be relinquishing a degree of control to service providers. This can lead to several questions:

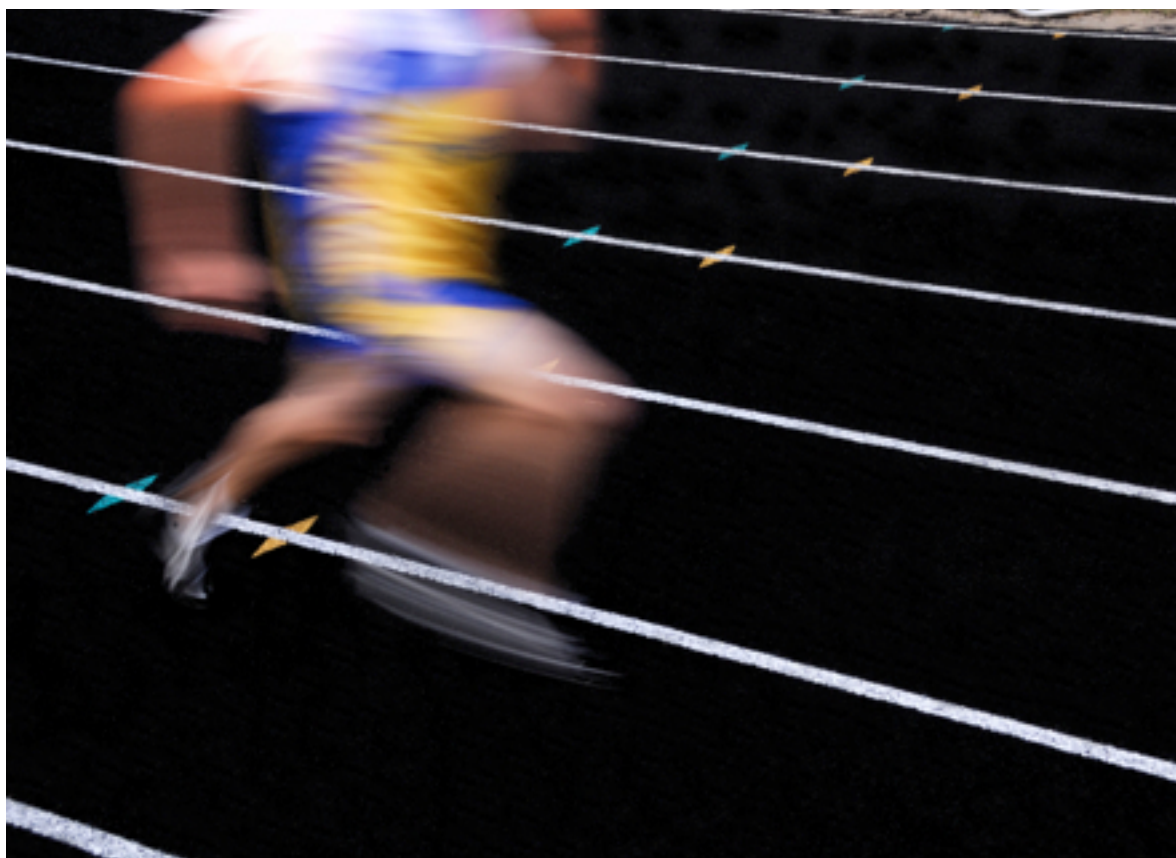
- Data ownership: e.g. does the data an organization creates, uses, and stores within a Cloud belong to that organization?
- Data access: can an organization's data be viewed, accessed, or used for unknown purposes without its prior knowledge or consent?
- Compliance with data-related norms and regulations: does the organization comply with regulations in a sufficiently controlled manner?

To counter data ownership and access concerns, agencies must ensure they have control of their data in the Cloud, and have the ability to manage trust, authentication, and authorization to this data. Most vendor solutions already allow for this.

Strict data privacy protection regulations, such as HIPAA, are causing Cloud providers to respond in several ways:

- Localized Solutions: Providers, such as Amazon now offer localized solutions that ease concerns around data residing outside of regulatory boundaries. Localization allows customers to choose a specific physical location or region where their Cloud resources will exist. This can help to ameliorate concerns related to the inability to identify the physical location of Cloud-based data.
- Certifications: Cloud providers are increasingly certified as complying with relevant industry-specific norms and regulations, such as SAS 70, SOX, HIPAA and PCI DSS

In general, agencies must work with providers when it comes to data governance, but this extends beyond Cloud Computing. Attention must be focused on adequately protecting government data throughout its life cycle in the agency and the Cloud, no matter what the technology.



Crawl, Walk, Run

Partner with NBC to jump-start Cloud at your agency

As agencies begin to respond to internal and external pressures to venture into Cloud Computing, NBC is developing a suite of Cloud products and services tailored to meet their needs. NBC's vision for Cloud Computing is that it retains the characteristics that make it successful in the private sector while becoming aligned with federal security, privacy and data preservation guidelines.

Each Cloud offering takes the flexibility and simplicity of Cloud Computing and marries it to the unique requirements of government agencies. NBCGrid will allow users to deploy low security and high security server templates, each configured to comply with specific government IT security requirements. NBCApps will offer HR and Acquisition software suites designed from the ground up for use in government.

NBC's Cloud Computing offerings are:

- Customer Focused
- Flexible & Simple
- Compliant With All Federal Guidelines for Data Security & Privacy

NBC's Cloud Offerings include **NBCGrid**, **NBCFiles** and **NBCApps**. **NBCGrid** provides flexible, user-provisioned infrastructure customers needing an IaaS solution. It integrates with **NBCFiles**, a Cloud storage offering that provides flexible Cloud-based storage. **NBCApps** is the NBC Software-as-a-Service offering for customers needing a tailored web-delivered application platform.

Other technologies are available to help support the unique needs of NBC's government clients. Services like **NBCAuth** will allow agencies to integrate their existing authentication platform with Cloud-based applications. **NBC's Hybrid Cloud** capability will allow agencies to meld their on-premise physical infrastructure with NBC-hosted Cloud servers, taking advantage of existing infrastructure investments while using the Cloud to handle new requirements.

NBC's Cloud Computing Future - Products

NBC is in the process of building its Cloud product and service offerings to address the needs of its customers. NBC plans to offer several specific Cloud products and services, some of which will be available by the end of the year. Each is tailored to meet the needs of government IT decision makers.

NBC Cloud Product	Description	Availability
NBCGrid	<p>NBCGrid is NBC's IaaS offering. This service will allow end-user provisioning of a variety of types of servers and operating systems through a single customer portal (cloud.nbc.gov). NBCGrid will provide technology-agnostic server hosting, with a variety of pricing models, including metered and pre-paid, based on the customer's usage of RAM or CPU per hour. Other planned features will include:</p> <ul style="list-style-type: none"> ■ User-defined server templates ■ Ability to template complex infrastructures ■ Access to a dedicated private and public block of IP addresses ■ Provisioning interface that allows console access via SSH or RDP, server restarts ■ Rapid (sub 15 minute) provisioning ■ Configurable storage space, RAM and network bandwidth ■ API access to allow programmatic creation, restart and deletion of servers ■ Multiple certification tiers with commensurate pricing. For example, a server certified to hold personal identifying information will cost incrementally more per hour than a standard server. NBC plans to offer Cloud infrastructure that is fully PII, FIPS and OMB 06-16 compliant and certified to contain PII data. ■ Payment via purchase card or PO ■ In the future, the ability to offer desktop as well as server virtualization 	Q4 2009
NBCFiles	<p>NBCFiles is NBC's Cloud storage offering. It allows burstable storage capacity on a metered, pay-per-gigabyte price model.</p> <p>NBCFiles usage and status can be monitored via the unified cloud.nbc.gov customer portal. NBCFiles's capabilities can be leveraged for application storage and content delivery, or as backup platform. Multiple security tiers drive pricing, similar to NBC's other offerings. NBCFiles will also offer the ability to integrate directly with on-site government networks.</p>	Q1 2010
Hybrid Cloud	<p>NBC's Hybrid Cloud capability allows customers to combine NBCGrid and NBCFiles with their existing infrastructure – creating front ends to complex web applications and “burstable” storage and server capacity in concert with existing NBC or client physical infrastructure.</p>	Q1 2010

NBC's Cloud Computing Future - Products

Continued

NBC Cloud Product	Description	Availability
NBCStage	<p>NBCStage is NBC's PaaS platform. It allows software developers to build applications with highly scalable capacity, while staying within the bounds of the Federal Government's IT regulations and standards. NBCStage will have language-specific APIs for many common programming languages.</p> <p>NBCStage will work in concert with the Federal Government's community of software developers to help make the product reflect their needs. Usage and application monitoring will be available from within the cloud.nbc.gov portal.</p>	Q2 2010
NBCApps	<p>NBC Apps is NBC's Cloud-based application marketplace. A variety of applications will be available, including general knowledge worker tools, as well as more highly-specialized applications:</p> <ul style="list-style-type: none"> ■ General Purpose: NBCApps offers a variety of software, including messaging, collaboration and Web 2.0 tools like wikis and blogs. ■ Acquisition: The AQD LoB SaaS offering will consist of an "on-demand" version of ESE which can be can be provisioned and administrated via the cloud.nbc.gov user portal. ■ HR: The HR LoB SaaS offering will include "on-demand" versions of HR's On-boarding, LMS, Performance & Competency Management and Time and Attendance packages. Each application can be provisioned and administrated via the cloud.nbc.gov user portal. <p>Pricing & service models will be similar to other NBC Cloud offerings.</p>	Q4 2009
NBCAuth	<p>NBCAuth is NBC's SaaS directory service, authentication & SSO product. It allows authentication between the different applications in NBC's Cloud product suite to occur seamlessly, and links back to an agency's internal directory services infrastructure, such as Active Directory.</p>	Q4 2009



NBC's Cloud Services

NBC's robust services offerings carries over to its Cloud products. NBC understands what it takes for agencies to make Cloud Computing operational within the boundaries of their organization, and will work with clients to help implement pilots or production Cloud infrastructure.

Strategy, integration, migration

NBC will help agencies determine which cloud services should be used, based on the business value they can provide, and how should they integrated with their current systems. NBC can conduct an assessment of an agency's existing applications, and help determine the right applications to migrate to the Cloud. NBC can use its expertise in Cloud to help agencies define cloud computing architecture, migration, and operations plans.

NBC will also work with agencies to build understanding of the types of enterprise services that can be moved to the Cloud, and how this will impact their compliance with Federal regulations. NBC can help agencies devise a strategy to maintain data privacy and protection standards that they may have in place with their on-premise infrastructure.

NBC can also help agencies determine the financial benefits of migration to the Cloud, helping to make the case for Cloud Computing.

Infrastructure & Application Management

NBC's traditional suite of infrastructure managed services will be available to its Cloud customers, including security and intrusion monitoring, backup, restore and disaster recovery, as well as administration of selected applications. Cloud clients will have access to some of the most advanced infrastructure management capabilities in the Federal Government. These capabilities include:

- NBC clients will be able to work with our architecture, operations and support leads to get assistance in solving their Cloud infrastructure challenges.
- NBC clients will be able to utilize existing tools and processes to monitor their Cloud infrastructure, including advanced availability monitoring and remote access capabilities.
- NBC clients will be able to define engineering standards for their customized server templates, including software components such as database software, and have these templates reviewed by NBC's infrastructure team.
- For highly critical applications, NBC will provide application management services for select applications.



Cloud Services: Security

NBC takes data security and information privacy seriously, and is a certified provider of certification and accreditation (C&A) services

Service	Description
Infrastructure Security	NBC utilizes a "defense-in-depth" security architecture utilizing different technologies across multiple vendors that would require an attacker to circumvent multiple layers of security before being able to access critical data.
Data leak prevention	Packet filtering firewalls are at the perimeter, as well as between zones on the internal network; intrusion detection and prevention systems monitor external and internal networks and systems.
Access Management	Virtual instances are completely managed under the control of customers. Customers are granted full access to all administrative capabilities. NBC administrators will only have access to customer instances if support is requested via the cloud.nbc.gov portal.
Data Protection	While NBC provides data encryption feature to protect data on storage media, customers can enable their own encryption mechanisms to secure the data.
PII Security	NBC's PII security is in accordance with OMB M06-16 and M07-16. From a protection standpoint, NBC has implemented Data Loss Prevention technologies to monitor the network and email or leakage of PII (SSN, Credit Card Numbers, etc). NBC is in the process of completing the implementation of an Enterprise Rights Data Management (ERDM) application that would allow encryption of files and storage of PII data.
Physical Security	NBC hosts its servers in its own data centers and within Government owned or leased buildings. Each of the data centers has physical access controls to limit and audit the access with CCTV monitoring and recording.
Privacy	While cloud privacy laws is in its infancy, NBC will align the emerging privacy laws surrounding Cloud Computing to address the customer interests while supporting any judicial regulations.
Forensic Analysis & Incident Management	NBC's takes a proactive approach to managing security incidents. This includes application, network and database vulnerability scanning. NBC couples this with its expertise in forensic analysis and rapid remediation, allowing it service the needs of agencies across the security spectrum.



NBC's Cloud

Through the use of NBC's Cloud products & services, agencies will be able to achieve some amazing things.

Cloud Infrastructure

Take advantage of NBC's NBCGrid to provide rapidly scalable infrastructure for your agency or provide virtual desktops for remote workforces

Cloud Bursting:

If your agency needs special capability, "burst" on to NBC's Cloud with our Hybrid Cloud technology.

Premise-to-Cloud Application Migration:

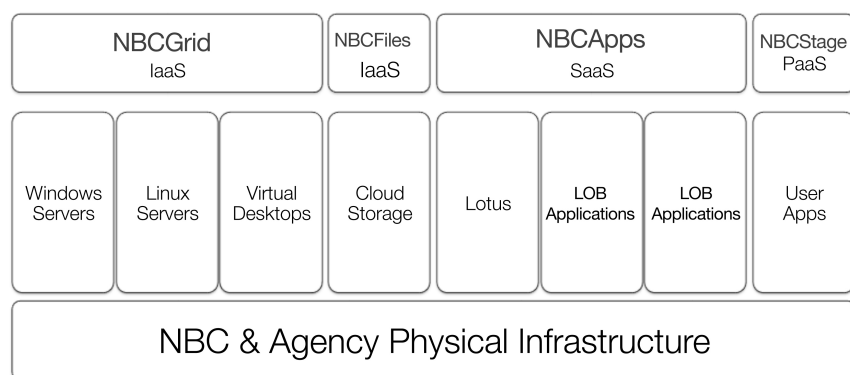
Your agency will be able to migrate applications from physical infrastructure to NBC's Cloud

SaaS Applications

Agencies can use NBCApps to provide collaboration & messaging capabilities to their users, or take advantage of NBC's LoB SaaS applications.

Cloud Storage

Use NBC's NBCFiles engine to provide low-cost, highly scalable, elastic storage for a variety of your agency's mission requirements.





Get Started With Cloud

Agencies can get started with Cloud Computing through targeted projects.

NBC suggests agencies introduce Cloud Computing into their organizations through a series of small projects. Each project will be tailored to build organizational interest in Cloud, introduce staff to the fundamentals of the new technology, and provide a compelling example of how Cloud can solve real business needs.

To make the preliminary projects successful, NBC suggests that agencies learn from Cloud software vendors, commercial Cloud providers, and explore low-cost COTS solutions to enable their Cloud. NBC also encourages agencies to take advantage of what shared service have to offer - NBC's own Cloud capabilities provide an ideal test bed for agencies seeking to experiment with Cloud Computing.

Before you begin on you agency's journey into Cloud Computing, keep a few guiding principals in mind.

1. Ease In

Pilot different application migration and cloud management products at your agency. Avoid "big bang" rollouts. Cloud technology and approaches are still emerging, and it is wise to experiment to find what fits your organization.

2. Fail Cheap

Pilot solutions should depend on standard software & hardware, decreasing the cost of a failure. Several vendors are building tools to allow enterprises to build private Clouds. Avoid implementing a heavily customized solution as a first step. Consider implementing a Cloud Lab or prototyping environment to allow your users direct access to Cloud technologies.

3. Learn From Commercial Providers

Learn from what Cloud vendors are doing to enable private clouds, and what approaches to delivering Cloud services are proving most successful. A nascent industry has sprung up around Cloud outsourcing. Many of these vendors offer capabilities such as user-driven provisioning and metered or reserved pricing that you should consider when implementing your agency's Cloud.

Grow Your Cloud: Pilot Projects

Partner with NBC to explore targeted Cloud pilot projects

Implement A New Technology

Social computing, also known as Web 2.0, is starting to gain momentum within government. But, social media tools like blogs and wikis often have trouble finding a home within an agency's existing IT environment. Since these tools are frequently lightweight and easy to implement, deploying an internal wiki or blogging platform on a Cloud IaaS platform would provide a good opportunity to give users a tool that they are asking for, while at the same time allowing your IT organization to experiment with the Cloud.

- I. Select a social media tool such as a wiki or blog.
- II. Engage a Cloud service provider that provides IaaS capabilities, allowing your IT team to quickly spin up a new server, and enforce the requisite security policies.
- III. Create a VPN link between your new Cloud server and your agency's internal network.
- IV. Give your users access to the new wiki or blog, and let them know that they are experimenting with two new technologies - Cloud Computing and Social Media. Publicize this effort internally to help build momentum around Cloud as a viable service platform within your organization.

Consolidate Applications

Agencies are often littered with applications that require dedicated infrastructure to support, but are used infrequently. Use Cloud technologies such as IaaS and Premise-to-Cloud application migration to move your legacy applications to Cloud servers.

- I. Select several applications that are not business critical, but require dedicated infrastructure to operate.
- II. Engage a Cloud service provider that provides IaaS capabilities, and also partners with a software company that builds products to allow migration from on-premise hardware to the Cloud
- III. Create mirror copies of the legacy applications within the Cloud infrastructure

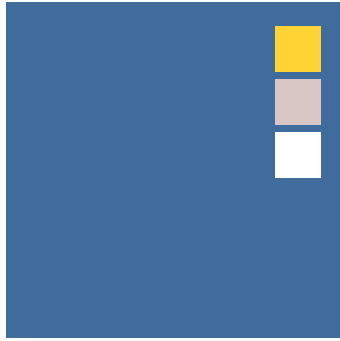


- IV. Publicize the cost savings and increased flexibility that the Cloud-based migration approach has yielded.

Distribute Content

As government seeks new ways to engage citizens, podcasts, video, and other multimedia formats are being used more frequently. Effectively distributing this content to a large audience can prove challenging. The next time your agency is asked to distribute a video to the public, consider using a Cloud storage and content distribution engine to ease the process, and shift the load from your own servers and onto Cloud-based resources.

- I. Propose your agency leadership provide the public with podcasts or videos about what the agency is doing to serve their needs or publicize a new initiative.
- II. Engage a Cloud service provider that provides Cloud-based storage and content distribution capabilities. You will notice that Cloud storage providers charge for both storage (typically by the gigabyte per month) as well as transfer bandwidth. For example, a Cloud storage provider might charge you a certain amount to store a one gigabyte video file, as well as a separate amount based on how many times that files has been accessed.
- III. You will want to have a good handle on the bandwidth previous projects of this type have consumed to help facilitate a comparison with Cloud storage.
- IV. Have your agency's PAO publicize the new content.



NBC: Optimized for Government

There are several advantages to using a shared service provider (SSP) such as NBC.

Shared Infrastructure Evolved

In the past, government agencies expended large amounts of resources on business infrastructure that was not reusable to support business processes that shared similarities with those occurring elsewhere in the government. OMB emphasizes the use of shared service centers to help decrease redundant agency IT projects, and associated expenditures.

Take advantage of NBC's massive scale to bring cutting edge applications to your agency

NBC has been tremendously successful at bringing this shared infrastructure approach to different government LoBs including HR and financial management. Through a shared services approach, NBC allows the government to create efficiencies and leverage standardized processes and business practices across government agencies. NBC has implemented several enterprise applications that are shared amongst a diverse group of government customers.

We are government, so we know government

Integrate Faster

NBC is taking the shared services concept a step further. Through the use of SOA and web services, NBC is working to reduce the complex integration challenges that agencies often face when attempting to integrate their legacy systems with NBC's LoB applications. By focusing on ways to make its systems more interoperable through SOA, NBC will ease burden of

legacy system integration, and allow agencies to take advantage of shared service center capabilities more easily.

By embracing SOA and web services, NBC will decrease the prevalence of custom interfaces between government systems, and make data more portable. This will help avoid vendor lock-in, and give agencies the freedom to more easily move between enterprise systems in response to changing regulations and standards.

NBC is the only ISO-9001 certified SSP

NBC Changes With Government

As new business services and technologies expand within government, NBC continues to incorporate them into its product offerings, allowing greater and more streamlined processes to be achieved. For example, if a new HR process and an associated technology becomes available, NBC can quickly adapt their systems and processes to match, generating value and increasing efficiency for all of its Federal clients.

As a shared service provider, NBC specializes in the systems and processes that make government more efficient and effective. It is uniquely positioned to drive through new technologies (such as Cloud Computing) across a wide swath of government agencies,

Committed To Quality

NBC has a comprehensive commitment to quality and is the only SSP to have achieved the coveted ISO-9001 certification. NBC also has a comprehensive risk management team that allows it to review individual client's risk profiles, and make suggestions to minimize risk. This is especially relevant in a Cloud environment, where the risks are still emerging. NBC's risk management approach can help clients identify the risks that Cloud Computing approaches entail, and make appropriate adjustments.



About NBC

The NBC's mission is to provide efficient and effective solutions to across common problems

Our Mission

The NBC's mission is to provide quality services and efficient solutions to meet customer business needs through our most important asset - our people.

Our Vision

NBC's vision is to become the preferred SSP and provider of administrative and management support services within DOI and to external Federal Agencies.

Our History

Nearly nine years ago, the Secretary of Interior established the National Business Center (NBC) with an important mission – to provide business management services and systems across the Department of the Interior (DOI) and to other Federal Agencies. The DOI recognized that by providing specific functional services, the NBC could deliver these services to agencies more efficiently, effectively, and economically than they could do so for themselves.

NBC's Capabilities

The NBC, through its strategic plan, has established each of its core LoBs to operate as SSPs. The LoB service offerings listed below, enable the NBC to achieve its SSP vision and offer its customers the best value alternative for business services.

Acquisition Services

Provide full life-cycle acquisition services including Contract Support for IT systems and services, Non-IT Services, Technology Research and Development, Supplies, Aviation Services, Construction, Financial Agreements, Appraisal Services and Facilities Leasing Services

Consulting

NBC's Federal Consulting Group (FCG) can provide agencies with solutions to a variety of management challenges including the development and implementation of strategic plans, business cases, return on investments (ROIs), and cost benefit analyses to justify customer support programs or outsourcing

initiatives. FCG can also help update management approaches through the use of Appreciative Inquiry, a methodology that features collaboration, employee engagement, positive change, and focused performance.

Human Resources

NBC's HR capabilities include services for assisting in managing human capital. The three key service offerings includes: Payroll Services, Core HR Application Services and HR Operational Services. NBC also provides capabilities to support training. The DOI University offers several training programs through Leadership and Performance Centers, Online Learning Systems and Services, and Cultural Resources and Events.

Financial Management Services

NBC provides customers with an array of financial services and systems. These services and systems are categorized as either Financial Management Systems Support or Business Process Outsourcing (BPO) Services.

Information Technology (IT) Services

NBC is a premier provider of internal IT Services to the NBC including Customer Call Center Support, eFIOA & Records Management, Application Hosting, Infrastructure Services, Information Management Services, and IT Security, all of which are offered in support of the Department, the NBC and our customers. NBC is one of the few government organizations that has been certified to provide certification and accreditation (C&A) services.

Administrative Operations Services

A wide variety of services are provided including Creative Communication Services, Employee Services, Facilities Management Services, and Drug and Alcohol Testing Services.

Aviation Services

NBC provides aviation safety services, aviation program management services, aviation safety training, aviation flight services support and aviation needs assessment services, as well as aviation mishap prevention policy and oversight in support of aviation function.

Appraisal Services

NBC provides appraisal Services to DOI Bureaus. The service offered includes General Appraisal Services. Appraisal Review Services, Valuation Program Management Services, Appraisal Consulting and Concession Valuation Services for customers



For more information
visit cloud.nbc.gov



NBC Federal Cloud Playbook

National Business Center
Department of the Interior
www.nbc.gov
Washington, DC